

WHAT IS CLAIMED IS:

1. A fin field effect transistor (FinFET), comprising:
a reversed T-shaped fin;
source and drain regions formed adjacent the reversed T-shaped fin;
a dielectric layer formed adjacent surfaces of the fin; and
a gate formed adjacent the dielectric layer.
2. The FinFET of claim 1, wherein the fin comprises at least one of silicon and germanium.
3. The FinFET of claim 1, wherein the dielectric layer comprises at least one of SiO, SiO₂, SiN, SiON, HfO₂, ZrO₂, Al₂O₃, HfSiO(x) ZnS and MgF₂.
4. The FinFET of claim 1, wherein the reversed T-shaped fin comprises an upper portion and a lower portion, wherein a height of the upper portion ranges from about 200 Å to about 1500 Å and wherein a height of the lower portion ranges from about 100 Å to about 1000 Å.
5. The FinFET of claim 4, wherein a width of the upper portion ranges from about 100 Å to about 1000 Å.
6. The FinFET of claim 5, wherein a width of the lower portion ranges from about 100 Å to about 1000 Å.

7. The FinFET of claim 1, wherein the gate comprises polysilicon.
8. The FinFET of claim 1, wherein the gate comprises a metal.
9. The FinFET of claim 8, wherein the metal comprises TiN.
10. The FinFET of claim 1, wherein a thickness of the dielectric layer ranges from about 10 Å to about 50 Å.
11. The FinFET of claim 1, wherein a thickness of the gate ranges from about 200 Å to about 1000 Å.
12. A method of forming a fin field effect transistor (FinFET), comprising:
 - forming a reversed T-shaped fin;
 - forming source and drain regions adjacent the reversed T-shaped fin;
 - forming a dielectric layer adjacent surfaces of the fin; and
 - forming a gate adjacent the dielectric layer.
13. The method of claim 12, wherein forming the reversed T-shaped fin comprises:
 - etching a first rectangular mesa using a rectangular mask having dimensions ranging from about 100 Å to about 1000 Å in width and from about 100 Å to about 1000 Å in length to produce the reversed T-shaped fin.
14. The method of claim 13, wherein etching the rectangular mesa comprises:

etching the mesa to a depth of 100-300 Å below an upper surface of the mesa.

15. The method of claim 14, further comprising:

forming a second rectangular mesa over the reversed T-shaped fin.

16. The method of claim 15, further comprising:

etching the second rectangular mesa to produce a gate that conforms to the reversed T-shaped fin.

17. A semiconductor device, comprising:

a fin structure including an upper portion and a lower portion, a width of the upper portion of the fin structure being smaller than a width of the lower portion of the fin structure;

source and drain regions formed adjacent the fin structure;

a dielectric layer formed over the fin structure; and

a gate formed over the dielectric layer.

18. The FinFET of claim 17, wherein the width of the upper portion ranges from about 100 Å to about 1000 Å and wherein the width of the lower portion ranges from about 100 Å to about 1000 Å.

19. The semiconductor device of claim 18, wherein a height of the upper portion ranges from about 100 Å to about 1000 Å and wherein a height of the lower portion ranges from about 100 Å to about 1000 Å.

20. The semiconductor device of claim 17, wherein a thickness of the dielectric layer ranges from about 10 Å to about 50 Å and a thickness of the gate ranges from about 200 Å to about 1000 Å.